s18quiz: EXP LOG (SLTN v238)
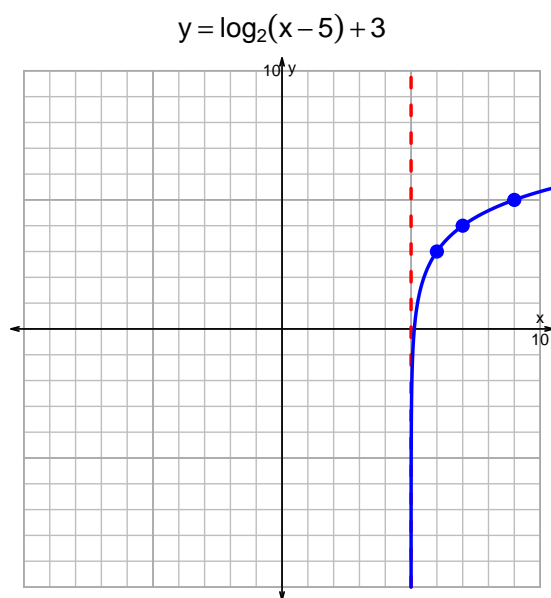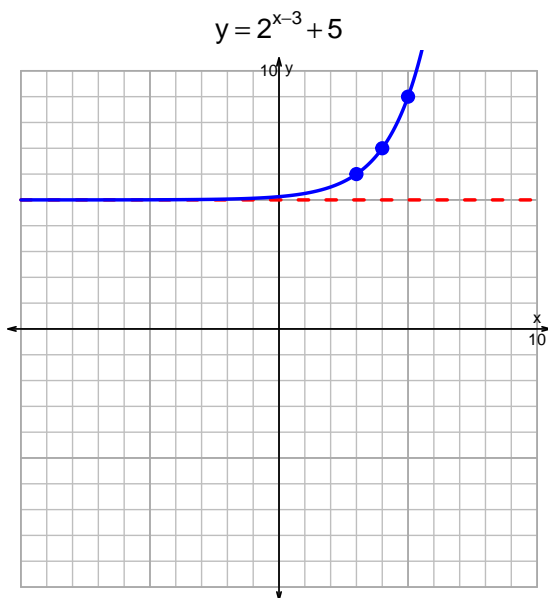
1. Graph $y = 2^{x-3} + 5$ and $y = \log_2(x - 5) + 3$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = 2^{x-3} + 5$$

$$y = \log_2(x - 5) + 3$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-17 = \left(\frac{-3}{5}\right) \cdot 2^{-7t/4}$$

Divide both sides by $\frac{-3}{5}$.

$$\frac{17 \cdot 5}{3} = 2^{-7t/4}$$

Take log, base 2, of both sides.

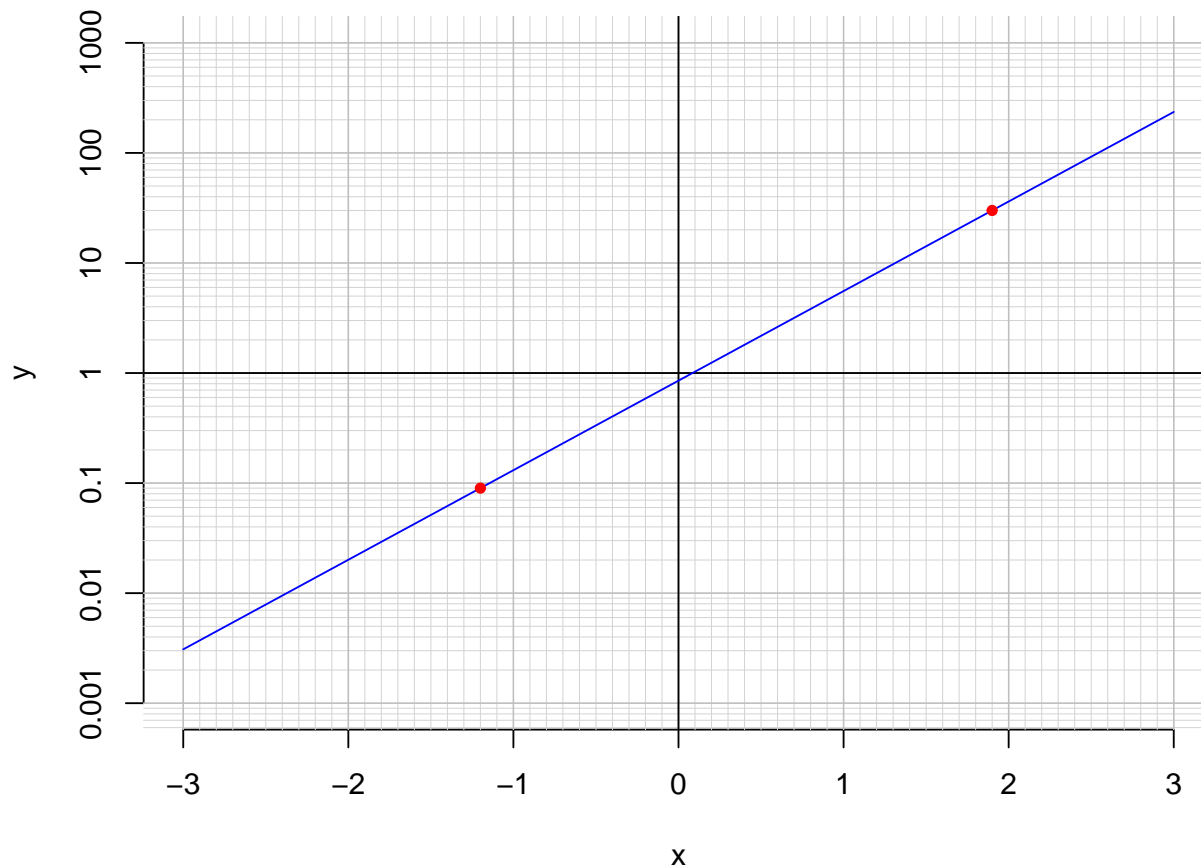$$\log_2\left(\frac{17 \cdot 5}{3}\right) = \frac{-7t}{4}$$

Divide both sides by $\frac{-7}{4}$.

$$\frac{-4}{7} \cdot \log_2\left(\frac{17 \cdot 5}{3}\right) = t$$

Switch sides.

$$t = \frac{-4}{7} \cdot \log_2\left(\frac{17 \cdot 5}{3}\right)$$

3. An exponential function $f(x) = 0.853 \cdot e^{1.87x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(-1.2)$.

$$f(-1.2) = 0.09$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{1.87} \cdot \ln\left(\frac{x}{0.853}\right)$$

c. Using the plot above, evaluate $f^{-1}(30)$.

$$f^{-1}(30) = 1.9$$